

WE CLAIM:

1. A radiation monitor comprising:
- (a) a first chamber comprising:
- a first electrically conductive housing having walls defining an internal volume of space;
- at least one hole through a cap of the first housing for permitting entry of ambient air into the internal volume of space; and
- a first solid state nuclear track detector (SSNTD) disposed within the first housing with a first thin electrically conducting cover;
- (b) a second chamber comprising:
- a second electrically conductive housing having walls defining an internal volume of space;
- at least one hole through a cap of the second housing for permitting entry of ambient air into the internal volume of space of the second housing;
- a second solid state nuclear track detector (SSNTD) disposed within the second housing with a second thin electrically conducting cover; and
- a diffusion barrier within the second housing;
- wherein the second solid state nuclear track detector (SSNTD) is generally isolated from radiation in the internal volume of space of the second housing;
- (c) a third chamber comprising:
- a third electrically conductive housing having walls defining an internal volume of space;

22 at least one hole through a cap of the third housing for permitting entry of
23 ambient air into the internal volume of space of the third housing;
24 a third solid state nuclear track detector (SSNTD) disposed within the third
25 housing with a third thin electrically conducting cover;
26 a diffusion barrier within the third housing;
27 wherein the third solid state nuclear track detector (SSNTD) is generally
28 isolated from radiation in the internal volume of space of the third housing.

1 2. The monitor of claim 1 wherein the second chamber further comprises
2 a seal around the diffusion barrier for generally isolating the second solid state nuclear track
3 detector (SSNTD) from thoron radiation in the internal volume of space of the second
4 housing.

1 3. The monitor of claim 2 wherein the seal is an O-ring seal.

1 4. The monitor of claim 2 wherein the second chamber further comprises
2 an O-shaped insert for holding the seal in place.

1 5. The monitor of claim 1 wherein the third chamber further comprises
2 a seal around the diffusion barrier for generally isolating the third solid state nuclear track
3 detector (SSNTD) from thoron radiation in the internal volume of space of the third housing.

1 6. The monitor of claim 5 wherein the seal is an O-ring seal.

1 7. The monitor of claim 5 wherein the third chamber further comprises
2 an O-shaped insert for holding the seal in place.

1 8. The monitor of claim 1 further comprising a fastening portion
2 provided on one of the first housing, the second housing and the third housing.

1 9. The monitor of claim 1 wherein there is generally no electrical charge
2 present on the radiation monitor.

1 10. The monitor of claim 1 wherein the first, second and third chambers
2 are arranged in a trilobed manner.

1 11. The monitor of claim 1 wherein the first housing, the second housing
2 and the third housing are cylindrically shaped.

1 12. The monitor of claim 1 wherein each of the first housing, the second
2 housing and the third housing is made from an electrically conductive material that shields
3 the inside of the housing from radiation.

1 13. The monitor of claim 1 wherein the first housing, the second housing
2 and the third housing are molded from conducting plastic with embedded nickel coated
3 carbon fibers.

1 14. The monitor of claim 1 wherein each of the first SSNTD, the second
2 SSNTD and the third SSNTD further comprises a solid state nuclear track film.

1 15. The monitor of claim 1 wherein each of the first SSNTD, the second
2 SSNTD and the third SSNTD further comprises a solid state nuclear track film made of allyl
3 diglycol carbonate.

1 16. The monitor of claim 1 wherein each of the first SSNTD, the second
2 SSNTD and the third SSNTD further comprises a solid state nuclear track film made of
3 cellulose acetate.

1 17. The monitor of claim 1 wherein each of the second chamber and the
2 third chamber further comprises a conducting foam for generally preventing entry of dust
3 therein.

1 18. The monitor of claim 1 further comprising:

2 (d) a fourth chamber comprising:

3 a fourth electrically conductive housing having walls defining an internal
4 volume of space;

5 at least one hole through a cap of the fourth housing for permitting entry of
6 ambient air into the internal volume of space; and

7 a fourth solid state nuclear track detector (SSNTD) disposed within the fourth
8 housing with a fourth thin electrically conducting cover.

1 19. The monitor of claim 18 further comprising a fastening portion and
2 an additional fastening portion respectively provided on two of the first housing, the second
3 housing, the third housing and the fourth housing.

1 20. The monitor of claim 18 further comprising a fastening portion
2 provided on one of the first housing, the second housing, the third housing and fourth
3 housing.

1 21. The monitor of claim 18 wherein there is generally no electrical charge
2 present on the radiation monitor.

1 22. The monitor of claim 18 wherein the first, second, third and fourth
2 chambers are arranged in a four-lobe manner.

1 23. The monitor of claim 18 wherein the first housing, the second housing,
2 the third housing and the fourth housing are cylindrically shaped.

1 24. The monitor of claim 18 wherein each of the first housing, the second
2 housing, the third housing and the fourth housing is made from an electrically conductive
3 material that shields the inside of the housing from radiation.

1 25. The monitor of claim 18 wherein the first housing, the second housing,
2 the third housing and the fourth housing are molded from conducting plastic with embedded

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3 nickel coated carbon fibers.

1 26. The monitor of claim 18 wherein each of the first SSNTD, the second
2 SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track
3 film.

1 27. The monitor of claim 18 wherein each of the first SSNTD, the second
2 SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track
3 film made of allyl diglycol carbonate.

1 28. The monitor of claim 18 wherein each of the first SSNTD, the second
2 SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track
3 film made of cellulose acetate.

1 29. The monitor of claim 18 wherein each of the second chamber and the
2 third chamber further comprises a conducting foam for generally preventing entry of dust
3 therein.

1 30. The monitor of claim 18 wherein the first chamber and the second
2 chamber comprise a first chamber pair for monitoring radiation and providing radiation
3 measurement data; and

4 the third chamber and the fourth chamber comprise a second chamber pair for
5 monitoring radiation and providing radiation measurement data;

6 wherein radiation measurement data uncertainty is calculated based on the
7 measurement data provided by the first and second chamber pairs.

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